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ABSTRACT

A sharp decline in the number of Scholastic Aptitude Test (SAT) candidates scoring over 600 (on a scale of 200-800), has been observed from 1969-70 through 1974-75. Several suggested explanations of this phenomenon relating to test-taking patterns are discussed. Specifically examined are the possibilities that fewer students take the SAT more than once, that fewer students take the Preliminary Scholastic Aptitude Test before the SAT, or that fewer high-scoring students take both the SAT and the ACT (American College Testing Program) battery. These factors might account for part of the observed declines. Although ideal data for testing all these explanations were not available, certain data suggest that while changes in test-taking patterns may have had some effect, they probably cannot entirely explain the downward trend in SAT score averages. (Author/EVH)

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An Examination of Declining Numbers of High-Scoring SAT Candidates

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One of the more mysterious aspects of the decline in verbal and mathematical scores by Scholastic Aptitude Test (SAT) candidates has been the decline in numbers of high scoring students. Had the number of high scoring students not declined, a theory attributing declines in mean scores to an enlargement of opportunity for college attendance and consequent changes in the composition of the SAT candidate group would seem more plausible. Since the declines in mean SAT scores are not attributable solely to increased numbers of low scoring students, but also to smaller numbers of high scoring students, it appears that such a theory cannot fully explain the decline in scores. The purpose of this paper is to provide some detailed information on the decline in numbers of high scoring students in the SAT candidate group and to examine several explanations of this phenomenon that have been proposed.

Table 1 gives the distributions of scores for students grouped by testing year. If a "high score" is taken to be one of 600 or greater, it is apparent that the percentage of test takers attaining high scores declined fairly sharply for the verbal test and more gradually for the mathematical test during the ten years shown in the table. However, it is not true that numbers of high scoring students declined steadily throughout this period.

For the verbal test, the number of students scoring over 600 actually increased from 1966-67 to 1967-68 and then remained almost level through 1969-70. From 1969-70 to 1970-71, this number dropped from 189,300 to 170,800--a drop of nearly 20,000--and continued to fall by about another 20,000 to 150,700 in 1971-72; by about 22,000 to 128,200 in 1972-73; by another 7,000 to 121,100 in 1973-74; by 11,000 to 110, 300, in 1974-75; and by about 2,000 more to 108,200 in 1975-76. From a high of 189,300 verbal scores of 600 or higher attained by students taking the test in 1969-70, the number of such scores fell by more than 80,000 to 108,200 in 1975-76.

For the mathematical test the pattern is similar - an increase in high scores from 1966-67 to 1967-68; almost constant numbers from 1967-68 through 1970-71; then a decline from 278,600 scores over 600 in 1970-71 to 213,900 in 1975-76--a decline of almost 65,000. The similarity of this pattern to that for the verbal test is not exact - the sharp decline in high verbal scores began in 1970-71, while that for mathematical scores began in 1971-72. It is clear, however, that declining numbers of high scores have not been characteristic of the entire period of score decline--from 1962-63 to the present--but only of the last five or six years.

Table 2 gives means, standard deviations, and numbers of cases for students grouped on a testing year basis for the last 20 years. Several facts emerge from examining this table and the data presented earlier:

(a) The total mean score declines from 1962-63 to 1969-70 were only 18 points (478-460) for SAT-V and 14 points (502-488) for SAT-M, average annual declines of 2.6 and 2.0 points, respectively. These contrast with declines from 1969-70 to 1975-76 of 31 points (460-429) for SAT-V and 18 points (488-470) for SAT-M, average annual declines of 5.2 and 3.0 points, respectively, over this six year period.

Table 1. Numbers (in thousands) and Percentages of Candidates in Given Score Ranges on the Scholastic Aptitude Test, 1966-67 through 1975-76

(a) Verbal

Score range	1966-67		1967-68		1968-69		1969-70		1970-71	
	Number	Percent	Number	Percent	Number	Percent	Number	Percent	Number	Percent
700-800. . . .	33.2	(2.3)	30.5	(2.0)	27.9	(1.8)	27.6	(1.7)	25.6	(1.7)
600-699. . . .	145.3	(10.2)	156.7	(10.1)	157.0	(9.9)	161.7	(10.1)	145.2	(9.4)
500-599. . . .	339.4	(23.9)	360.8	(23.4)	379.3	(23.9)	378.4	(23.6)	361.8	(23.5)
400-499. . . .	503.5	(35.4)	534.9	(34.6)	548.8	(34.6)	530.9	(33.1)	520.2	(33.8)
300-399. . . .	325.4	(22.9)	378.1	(24.5)	377.7	(23.8)	401.7	(25.0)	385.7	(25.1)
200-299. . . .	75.7	(5.3)	82.9	(5.4)	94.9	(6.0)	105.4	(6.6)	98.6	(6.4)
	1422.5		1543.8		1585.6		1605.9		1537.2	

Score range	1971-72		1972-73		1973-74		1974-75		1975-76	
	Number	Percent	Number	Percent	Number	Percent	Number	Percent	Number	Percent
700-800. . . .	20.0	(1.4)	16.0	(1.1)	16.8	(1.2)	14.8	(1.1)	15.9	(1.1)
600-699. . . .	130.7	(9.0)	112.2	(8.0)	104.3	(7.7)	95.5	(7.0)	92.3	(6.5)
500-599. . . .	332.5	(22.8)	300.1	(21.5)	279.6	(20.6)	289.4	(21.1)	273.1	(19.3)
400-499. . . .	493.4	(33.8)	470.2	(33.6)	463.7	(34.2)	468.5	(34.2)	474.2	(33.5)
300-399. . . .	378.6	(25.9)	390.7	(27.9)	378.5	(28.0)	376.4	(27.4)	405.8	(28.7)
200-299. . . .	104.7	(7.2)	109.2	(7.8)	111.2	(8.2)	126.7	(9.2)	153.6	(10.9)
	1459.9		1398.4		1354.0		1371.2		1415.0	

(Continued)

Table 1 (Continued)

(b) Mathematical

Score range	1966-67 Number	1966-67 Percent	1967-68 Number	1967-68 Percent	1968-69 Number	1968-69 Percent	1969-70 Number	1969-70 Percent	1970-71 Number	1970-71 Percent
700-800.	55.5	(3.9)	56.2	(3.6)	55.9	(3.5)	56.0	(3.5)	55.7	(3.6)
600-699.	199.0	(14.0)	225.9	(14.6)	224.0	(14.1)	224.4	(14.0)	222.9	(14.5)
500-599.	413.3	(29.1)	442.2	(28.6)	454.1	(28.6)	457.7	(28.5)	428.3	(27.9)
400-499.	465.8	(32.7)	478.5	(31.0)	495.1	(31.2)	497.6	(31.0)	483.2	(31.4)
300-399.	248.1	(17.4)	282.4	(18.3)	296.3	(18.7)	303.5	(18.9)	291.9	(19.0)
200-299.	40.7	(2.9)	58.6	(3.8)	60.2	(3.8)	66.6	(4.1)	55.2	(3.6)
	1422.5		1543.8		1585.6		1605.9		1537.2	

Score range	1971-72 Number	1971-72 Percent	1972-73 Number	1972-73 Percent	1974-74 Number	1974-74 Percent	1974-75 Number	1974-75 Percent	1975-76 Number	1975-76 Percent
700-800.	44.3	(3.0)	44.8	(3.2)	46.3	(3.4)	45.5	(3.3)	44.1	(3.1)
600-699.	203.2	(13.9)	184.0	(13.2)	175.9	(13.0)	168.7	(12.3)	169.8	(12.0)
500-599.	415.3	(28.4)	402.8	(28.8)	365.2	(27.0)	360.6	(26.3)	371.2	(26.2)
400-499.	449.4	(30.8)	429.1	(30.7)	413.1	(30.5)	413.1	(30.1)	425.6	(30.1)
300-399.	290.2	(19.9)	280.8	(20.1)	291.6	(21.5)	315.1	(23.0)	314.3	(22.2)
200-299.	57.6	(3.9)	57.0	(4.1)	61.9	(4.6)	68.1	(5.0)	89.9	(6.4)
	1459.9		1398.4		1354.0		1371.2		1415.0	

(b) For the years from 1962-63 to 1969-70 the relatively small annual declines in mean scores were accompanied by increasing numbers of students taking the test--from 933,100 in 1962-63 to 1,605,900 in 1969-70.

(c) As indicated earlier, although the percentages of high scoring students declined as the size of the test-taking groups increased, the absolute numbers of such students did not decline prior to 1969-70. Thus, for the first seven years, the declines in mean scores can be attributed to increasing numbers of students in the middle and lower score ranges, and not to smaller numbers of students scoring over 600.

While the data presented here cannot support any definite conclusions about the validity of a theory attributing score declines to changes in the SAT test taking group, the SAT data for the years from 1962-63 through 1969-70 seem consistent with such a theory. A considerable body of evidence that could be brought to bear on this issue will be available to the panel in other reports. However, a few salient points may be noted here:

Table 2. Means, Standard Deviations, and Numbers of Cases* for all Candidates Taking the SAT, by Year, 1956-57 through 1975-76

Testing year	SAT-Verbal Mean	SAT-Verbal S.D.	SAT-Mathematical Mean	SAT-Mathematical S.D.	N/1000
1956-57	473	105	496	111	270.5
1957-58	472	106	496	109	376.8
1958-59	475	106	498	110	469.7
1959-60	477	108	498	109	564.2
1960-61	474	108	495	109	716.3
1961-62	473	109	498	112	802.5
1962-63	478	109	502	111	933.1
1963-64	475	108	498	113	1,163.9
1964-65	473	108	496	112	1,361.2
1965-66	471	108	496	111	1,381.4
1966-67	467	109	495	110	1,422.5
1967-68	466	108	494	112	1,543.8
1968-69	462	108	491	111	1,585.6
1969-70	460	110	488	113	1,605.9
1970-71	454	109	487	113	1,537.2
1971-72	450	108	482	112	1,459.9
1972-73	443	107	481	112	1,398.4
1973-74	440	107	478	115	1,354.0
1974-75	437	108	473	114	1,371.2
1975-76	429	109	470	118	1,415.0

*The term "case" denotes attendance at an SAT administration. Thus, if an individual was tested twice, he (she) is counted twice in these tabulations.

(a) The Condition of Education (1976), published by NCES, gives the following figures for ratios of first-time degree credit enrollment to numbers of high school graduates one year earlier (Table 4.13):

School year	Graduates (in thousands)	School year	College entrance (in thousands)	Percent of graduates
1957-58	1,506	1958-59	772	51.3
1962-63	1,957	1963-64	1,046	53.6
1964-65	2,665	1965-66	1,442	54.1
1967-68	2,702	1968-69	1,630	60.3
1970-71	2,943	1971-72	1,766	60.0
1973-74	3,069	1974-75	1,854	60.4

It appears that there was a sharp rise in percentage of high school graduates attending college during the 1960's and a leveling off since then at about 60 percent.

(b) The number of students participating in the ACT assessment program shows a trend similar to that for the SAT--rising from 1962-63 to 1970-71 and then declining for the next few succeeding years. (Source: Leo Munday, "Declining Admissions Test Scores," ACT Research Report No. 71.)

(c) An analysis of distribution of SAT score reports by W. B. Schrader ("Distribution of SAT Scores to Colleges as an Indicator of Changes in the SAT Candidate Population," September 1976) indicates that the overall number of SAT score reports sent to colleges almost doubled between 1960-61 and 1966-67 (consistent with the increase in number of candidates). In addition, there were marked increases in the percentages of reports to comprehensive universities and colleges and to two-year colleges and decreases in percentages (but not number) of reports to the most selective institutions--private research universities and liberal arts colleges. Between 1966-67 and 1973-74 both the total number of reports and the percentage distribution of reports over types of colleges were much more similar.

The three sets of evidence alluded to above and the SAT data discussed earlier that changes in the numbers of students going to college (and probably in the composition of that population) during the early years of the score decline may have caused progressive changes in the SAT candidate groups that could help to account for this part of the decline. For the years from about 1970-71 to the present, there appears to be less evidence consistent with a population shift hypothesis and there is a need, particularly for the last six years, to explain a decrease in the numbers of high scoring students taking the SAT (not just an increase in numbers of lower scoring students).

The remainder of this paper will address several explanations that have been offered for the decline in high scoring students. Before examining these issues, it may be useful to provide assurance that the declines in numbers of high scoring students are not simply the result of less repeated test taking. Since the distributions presented earlier are based on all students tested in a given year, it is conceivable that the smaller numbers of over-600 scores are caused by a tendency of high-scoring students in more recent years to take the test only once. Since 1971-72, distributions of scores have been calculated also for so-called

"cohorts"--groups of students aggregated according to their year of high school graduation. For these distributions only one set of scores (the most recent one) is used for each student. The cohort distributions of SAT scores are given in Table 3.

It is apparent from Table 3 that it is not just the numbers of SAT scores over 600 that have declined. The number of students taking the SAT and attaining these scores has also declined. The following table of numbers (in thousands) of over-600 scores for students grouped in the two ways is informative:

	Verbal		Mathematical	
	Test year	Cohort	Test year	Cohort
(a) 1971-72.	150.7	116.6	247.5	182.6
(b) 1975-76.	108.2	82.0	213.9	163.4
(b)/(a)	.72	.70	.86	.89

It is clear that both sets of data show similar rates of decline in numbers of high scores over the last five years.

The explanations of the declining numbers of high scoring students generally fall in two classes: (a) those that assume that there are simply fewer highly able students in the high school graduate populations of recent years, and (2) those that assume there are as many highly able high school students, but that fewer are taking the SAT. Data relating directly to hypotheses in the first class are hard to come by. However, examination of certain existing data may help in deciding how much credence should be given to explanations of the second type. Among these are: (1) the assertion that many of the able high school students are not attending college and thus not taking any admissions test, (2) the assertion that able students are being admitted to college on the basis of other information (including PSAT/NMSQT scores) and thus take the SAT less frequently, and (3) an assertion that able students are less likely to take both the SAT and the ACT Assessment and thus appear less often in the SAT statistics. (This last theory could, in fact, explain a loss of high scoring students in both programs; ACT reports a constant percentage of high scoring students--14 percent in the 26-36 interval--over the last five years which in the light of a lowering of total number of students tested over this period would suggest some decline in numbers of high scoring students.)

One set of evidence that may relate to all the assertions described above is the body of information developed from the responses to the Student Descriptive Questionnaire (SDQ). The first cohort for which complete SDQ information is available is 1972-73 and the most recent is 1975-1976. From Table 3 it can be seen that from the 1972-73 to 1975-76 cohort, the number of students scoring over 600 declined from 98,256 (9.7%) to 81,964 (8.2%) for the verbal test and from 169,029 (16.7%) to 163,398 (16.3%) for the mathematical test. Over this same period, examination of SDQ responses for 10% samples of SAT takers reveals that: the percent of students reporting they ranked in the top 10th of their

Table 3. Numbers (and Percentages) of Candidates in Given Score Ranges on the Scholastic Aptitude Test, 1971-72 through 1975-76, for Students Grouped According to Year of High School Graduation

(a) Verbal

Score range	1971-72		1972-73		1973-74		1974-75		1975-76	
	Number	Percent	Number	Percent	Number	Percent	Number	Percent	Number	Percent
700-800. .	17,560	(1.7)	12,537	(1.2)	14,677	(1.5)	11,380	(1.1)	12,288	(1.2)
600-690. .	99,070	(9.7)	85,719	(8.4)	84,089	(8.5)	67,753	(6.8)	69,676	(7.0)
500-590. .	239,755	(23.4)	221,295	(21.8)	212,480	(21.6)	202,833	(20.4)	199,099	(19.9)
400-490. .	334,118	(32.7)	341,880	(33.7)	325,516	(33.0)	338,015	(33.9)	321,520	(32.2)
300-390. .	261,233	(25.5)	269,510	(26.6)	267,256	(27.1)	278,311	(27.9)	289,798	(29.0)
200-290. .	71,084	(6.9)	83,912	(8.3)	81,221	(8.2)	98,136	(9.8)	107,428	(10.7)
	1,022,820		1,014,853		985,239		996,428		999,809	

(b) Mathematical

Score range	1971-72		1972-73		1973-74		1974-75		1975-76	
	Number	Percent	Number	Percent	Number	Percent	Number	Percent	Number	Percent
700-800. .	37,067	(3.6)	31,588	(3.1)	36,242	(3.7)	33,005	(3.3)	37,511	(3.8)
600-690. .	145,535	(14.2)	137,441	(13.5)	133,602	(13.6)	122,511	(12.3)	125,887	(12.6)
500-590. .	284,242	(27.8)	291,991	(28.8)	262,211	(26.6)	257,283	(25.8)	254,672	(25.5)
400-490. .	311,713	(30.5)	306,916	(30.2)	302,225	(30.7)	299,528	(30.1)	290,467	(29.1)
300-390. .	200,502	(19.6)	202,317	(19.9)	209,452	(21.3)	230,912	(23.2)	227,729	(22.8)
200-290. .	43,621	(4.3)	44,451	(4.4)	41,383	(4.2)	53,152	(5.3)	63,510	(6.4)
	1,022,680		1,014,704		985,115		996,391		999,776	

class rose from 15.3% to 17.8%; the percent with average reported grades of 3.75--4.00 rose from 11.5% to 13.1%; the percent reporting having received 3 or more scholastic honors rose from 13.8% to 16.3%; the percent planning graduate study rose from 26.8% to 31.0%. If it is true that there are as many able students among high school graduates but that fewer are currently taking the SAT (for whatever reason), one would expect the withdrawal of these students from the SAT pool to be reflected in declines rather than increases in the percentage of students giving these responses that are more characteristic of high scoring students.

Despite the evidence from the SDQ that the SAT taking group has not changed in recent years in ways that would help to account for smaller numbers and percentages of high scoring students, some analysis of the possible effects of changes in test-taking patterns on the composition of the SAT group may be warranted. In the case of the PSAT to SAT comparison it would be ideal to have analyses of matched and unmatched candidates over time, so that any trend among high scoring students to take only the PSAT could be ascertained. Unfortunately these analyses do not exist and cannot be done now since the necessary PSAT data is not available for the early years. However, a match of records for high school juniors taking the PSAT in October, 1973 with SAT files yields the following partition of that group.

	Verbal			Mathematical		
	PSAT only	PSAT and SAT	Total	PSAT only	PSAT and SAT	Total
PSAT 60-80	12,183	49,800	61,983	31,889	99,661	131,550
Score 20-59	424,773	580,845	1,005,618	404,789	530,984	935,773
	436,956	630,645	1,067,601	436,678	630,645	1,067,323

It is apparent that students attaining high scores on the PSAT are much more likely than lower scoring students to take the SAT also. For the verbal test 80 percent of the high scoring PSAT candidates also took the SAT while only 58 percent of the lower scoring candidates did. For the mathematical test the corresponding percentages were 76 percent and 57 percent.

Another way of considering this matter is to observe from Table 3 that for the verbal test the number of students scoring 600 or higher on the SAT fell from 116,630 for the 1971-72 cohort to 79,133 for the 1974-75 cohort. (The 1974-75 cohort is the one that includes the 1973 PSAT juniors.) Thus, almost 37,500 fewer high scoring SAT candidates have to be accounted for. Since there were only about 12,000 students from the 1974-75 class who took the PSAT as juniors gaining verbal scores of 60-80 but not repeating the SAT, it does not appear that many of the "missing" SAT candidates can be found taking the PSAT only.

This analysis is (of necessity) a fairly rough one. Some of the stu-

dents scoring lower than 60 on the PSAT and who did not take the SAT would have obtained scores higher than 600 on the SAT. Similarly, some of those scoring 60 or higher on the PSAT would have scored lower than 600 on the SAT. However, available data on change in scores from junior year PSAT scores to later SAT scores suggests that even if all the 1973 PSAT juniors had later taken the SAT (an extreme assumption), the number of students in the 1974-75 cohort scoring 600 or higher on the SAT would not have increased by much more than 12,000. It may be that such factors as early college entrance or waiving by colleges of SAT requirements has had some effect on numbers of high scoring SAT candidates, but available data do not indicate that acceptance of PSAT scores in place of SAT scores (if this is occurring) has had a large effect.

The other suggested explanation relating to test taking pattern attributes declines in numbers of high scoring students to less joint taking of SAT and the ACT Assessment. Again, ideal data for testing this theory (counts of matched and unmatched SAT and ACT candidates by score level over time) do not currently exist, although the necessary raw data is undoubtedly available. In the absence of such counts, however, the following analysis may shed some light on the question.

In certain states nearly all college-bound students take the SAT and very few take ACT; in certain other states the situation is reversed; and in some states both tests are taken by sizable numbers of students. If the theory in question is correct, we should see relatively little decline in numbers of high scoring students in those states where very few students take ACT, since the effect of a shift to ACT or of less joint taking of SAT and ACT could not be sizable in such states. Because the data were readily available in convenient form, the numbers of students scoring 600 or higher on SAT-V and SAT-M were tabulated for the 1972-73 and 1975-76 cohorts for 18 states that were known to be states in which students taking SAT far outnumber those taking ACT. the results are:

SAT	Verbal				Mathematical			
score	1972-73		1975-76		1972-73		1975-76	
600-800.	52,875	(8.6%)	45,135	(7.1%)	91,808	(14.9%)	90,588	(14.3%)
200-590.	563,619	(91.4%)	588,080	(92.9%)	524,582	(85.1%)	542,598	(85.7%)
	616,494		633,215		616,390		633,186	

It is clear that both numbers and percentage of students scoring over 600 are declining in these states as well as in the rest of the nation. The hypothesized ACT effect probably cannot fully explain this decline. However, it may be noted that the rate of decline was slightly less steep in these states than for the entire nation. For the verbal test, for example, there were 7,740 fewer students in the 1975-76 cohort from these states scoring over 600. For the total groups, the decline was 16,292. Thus despite the fact that more than 60 percent of the SAT takers from each cohort are from these states, more than half the decline in numbers of students scoring over 600 occurred elsewhere.

For a variety of reasons, these data cannot support definitive conclusions. However, the results suggest that the decline in numbers of high scoring students is not solely attributable to changing test-taking patterns. The data are consistent with the hypothesis that smaller numbers of high scoring students may be due in part to a lower rate of participation in both testing programs by such students, but they cannot confirm that hypothesis. Other studies would be needed to provide such confirmation.

Summary

1. Although percentages of students scoring over 600 on SAT-V and SAT-M have been declining at least since 1966-67, the absolute numbers of such students began to decline only in 1970-71.

2. Data on trends for numbers of students scoring in given ranges on the SAT as well as overall numbers of SAT participants appear to be consistent with the theory that declines prior to 1970-71 can be accounted for largely by changes in the SAT taking group.

3. Declines in absolute numbers of high scoring students for the last six years accompanied by increases in percentage of SAT takers reporting high levels of high school achievement make the population shift theory less plausible as an explanation of score declines over this period.

4. Limited data suggest that changes in test taking patterns (for example, reduced joint taking of PSAT and SAT or ACT and SAT) could account for some of the decline in numbers of high scoring students, but further study would be needed before confident statements on this topic could be made. Data on the composition of the SAT group collected by means of the SDQ (as noted in point three above), data on matched PSAT and SAT student records, and data on SAT takers in selected states all suggest that the declining numbers of high scoring students in recent years are not solely attributable to changes in the composition of the test taking group (brought about by changing patterns of test taking or by other factors).